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October 20, 1983

Mr. Hal Robbins
Air Quality Bureau
Department of Health and Environmental Sciences
Cogswell Building
Helena, Montana 59601

Dear Hal:

Attached is the third quarter monthly fluoride emission report. As you can see, the August emissions exceed the 2.6 lbs. fluoride per ton of aluminum produced standard. We realize that you have been made aware of the circumstances involved in these excess emissions, but we want to summarize the conditions existing during this period.

Although a combination of factors were responsible for the excess emissions, we feel that the major contribution resulted from the start up of line 1 during July. This start up, as far as bringing the cells on line, was completed by the end of July. The effects on the two other lines continued on into August. The peak emissions occurred during the first week of August and continuously declined from that time until the middle of September when restart of line 4 began. Our emissions during July were in excess of the State standard, but per your memo to the files dated June 20, 1983, we were exempt from the emission regulations under ARM 16.8, subchapter 15. August emissions were a secondary result of startup.

A cell operating in the most productive and efficient manner produces the least amount of emissions. Any deviation from this maximum efficiency causes an increase in emissions. When new cells are brought on line they must be charged with molten bath material from the operating cells. This requires that the latter cells be operated in an abnormal manner such that they produce excess bath, resulting in operating problems that cause excess emissions.

Cell operating parameters are varied and complex. Returning cells from excess bath to normal conditions requires a considerable amount of time. In the meantime, the upset conditions continue to cause excess emissions. This was particularly acute in this case since only two lines were available for supplying the needed bath, and the cells on these lines were pushed to their operating limits.

In this case, the upset conditions resulting from start up were exacerbated by several other factors. The petroleum coke we used for anodes was unsuitable for our type of cell. The anode tended to disintegrate causing excessive dust and anode shatter into the electrolytic bath. This created a condition whereby the cell had to be opened to clean out the carbon material and resulted in excess emissions. We have discontinued its use and substituted a new coke in April.

Approximately three months were required for the unsuitable coke to be consumed in the cell. The new coke began reaching the anode-bath interface during July and August. We have seen a definite improvement in cell operation since the new coke reached the anode surface.

Another contribution to emissions was the recall of new cell operators for start up. These employees receive intensive training, but until they have some experience, problems with operations can and do occur. In addition to their operating training, these employees (and all others for that matter), have been made acutely aware of the importance of keeping emissions at a minimum.

In addition to the above items regarding the emissions during this period, there are several other pertinent factors that we wish to call to your attention. First, the fluoride in forage levels in the three plots remained well within the standards during this period. An intensive vegetation survey conducted in late August shows that the excess emissions had no effect on the most sensitive species (goatweed, Oregon grape and gladiolus) in the vulnerable areas behind Teakettle mountain and on the Alexander property. This was not surprising since the actual amount of fluoride emitted during July and August remained below the previous state standard of 864 pounds fluoride per day.

Secondly, the upset cell conditions during this period also resulted in decreased aluminum production. This of course causes the emissions to production ratio (pounds fluoride per ton of Aluminum produced) to increase.

Finally, we feel confident that we can control emissions within the standard during additional line startups. The combination of more suitable coke in the anodes, additional experience on the part of cell operating personnel, and the availability of two more lines to help supply bath material, should combine to keep the emissions down.

In summary, we feel that a combination of factors caused the excess fluoride emissions during July and August. We emphasize the fact that operations during this period certainly did not constitute representative conditions.

Your memo to the files dated September 12, 1983, listed three possible courses of action relating to excursion of emission standards; (a) take no action, (b) encourage voluntary compliance, and (c) issue a notice of violation. Our September emissions were 2.30 pounds per ton of aluminum produced and our October emissions through October 17, have averaged 2.03 pounds per ton of aluminum produced.

We respectfully request that you exercise option (a) or (b). We do not expect further emission excursions and we feel that the circumstances were unique. Your consideration will be appreciated.

Sincerely,

Don kg

Donald F. Ryan
Technical Superintendent

Attachment

mc: R. A. Sneddon
T. F. Payne
J. A. Canavan
L. W. Smith
K. G. Reick
R. W. Simmons